

# SCIENCE

VOL. LVI DECEMBER 29, 1922 No. 1461

<i>The Explanation of the Colloidal Behavior of Proteins: DR. JACQUES LOEB.....</i>	731
<i>The Award of the Henry Draper Medal.....</i>	741
<i>Appeal on behalf of the League of Nations for Aid to Austrian Intellectual Workers....</i>	743
<i>Scientific Events:</i>	
<i>London Bird Sanctuaries; The American Electrochemical Society; Professor Max Weber; Officers of the American Chemical Society; The Hayden Award of the Philadelphia Academy .....</i>	744
<i>Scientific Notes and News.....</i>	747
<i>University and Educational Notes.....</i>	750
<i>Discussion and Correspondence:</i>	
<i>Research in Marine Biology: PROFESSOR W. J. CROZIER. On Translating Einstein: DR. E. E. SLOSSON. On the Formation of Family Names like Tingidæ: DR. H. M. PARSHLEY. The Beginnings of American Geology: DR. MARCUS BENJAMIN.....</i>	751
<i>Quotations:</i>	
<i>The Federal Budget; The Appreciation of Science .....</i>	755
<i>Scientific Books:</i>	
<i>Glover's United States Life Tables: PROFESSOR RAYMOND PEARL.....</i>	756
<i>Special Articles:</i>	
<i>X-ray Crystallometry; X-ray Wave Lengths; Space-lattice Dimensions and Atomic Masses: DR. L. W. MCKEEHAN. Peripheral Migration of a Centriole Derivative in the Spermatogenesis of Ecanthus: DR. H. H. JOHNSON.....</i>	757

SCIENCE: A Weekly Journal devoted to the Advancement of Science, publishing the official notices and proceedings of the American Association for the Advancement of Science, edited by J. McKeen Cattell and published every Friday by

## THE SCIENCE PRESS

11 Liberty St., Utica, N. Y. Garrison, N. Y.

New York City: Grand Central Terminal

Annual Subscription, \$6.00 Single Copies, 15 Cts.  
Entered as second-class matter January 21, 1922, at the Post Office at Utica, N. Y., Under the Act of March 3, 1879.

## THE EXPLANATION OF THE COLLOIDAL BEHAVIOR OF PROTEINS<sup>1</sup>

### I

THIS year's Pasteur lecture coincides with the commemoration of the hundredth anniversary of Pasteur's birth. The application of Pasteur's ideas and discoveries has benefited humanity to such an extent that they have become part of the consciousness of civilized mankind. What is, perhaps, less widely understood is the fact that Pasteur changed the method of medical research. In the study of infectious diseases Pasteur substituted for the method of hit or miss (with the chances infinitely in favor of missing) the method of a definitely oriented search which never fails to give results when properly applied. Thousands of physicians had studied infectious diseases before Pasteur, but they tried to solve their problem by starting from observations of the symptoms of some special disease. This led to no result for the simple reason that without knowing beforehand for what to look—or, in other words, without knowing the general cause of infectious diseases—it was impossible to discover the cause of any special infectious process. Pasteur reversed this method by his discovery of the action and omnipresence of microorganisms, leaving it to the medical men to look for the special agency in the individual cases.

There is little doubt that the old empiricism, still in vogue in some other fields of medicine and in the physiological sciences, must be replaced by the more rationalistic method of Pasteur of knowing the general fundamental principles before attempting to explain the more special phenomena, since, unless we follow this method, we never know which of

<sup>1</sup> Pasteur Lecture delivered before the Institute of Medicine of Chicago on November 24, 1922.

## CORNELL UNIVERSITY MEDICAL COLLEGE

First Avenue and Twenty-eighth Street  
NEW YORK CITY

The first year of the course is also  
offered at Ithaca, N. Y., subsequent  
years at New York City only.

For Information Address  
THE SECRETARY

## Northwestern University MEDICAL SCHOOL

Situated in Chicago in close proximity to important Hospitals with an abundance of clinical material.

**ADMISSION REQUIREMENTS**—Two years of College credit including a satisfactory course in Physics, Chemistry, Biology or Zoology, and French or German.

**COURSE OF STUDY**—leading to the degree of Doctor of Medicine—Four years in the Medical School and a fifth year either as Interne in an approved hospital or devoted to research in some branch of Medical Science.

**GRADUATE INSTRUCTION**—in courses leading to the degree of Master of Arts or Doctor of Philosophy.

**RESEARCH FOUNDATION**—The James A. Patten Endowment for Research affords unusual opportunities for advanced students of Medical Science to pursue special investigations.

**RESEARCH FELLOWSHIPS**—Four fellowships of the value of \$500 each are awarded annually to promote scholarly research.

**Tuition fees** of the first and second years, \$190.00 a year. The third and fourth years, \$200.00 a year.

For information address

**C. W. PATTERSON, Registrar**

2421 South Dearborn Street, Chicago, Illinois

## THELCO CONSTANT TEMPERATURE DRYING OVENS



LARGE DOUBLE WALL THELCO OVEN

In the laboratory as well as in the mill we must constantly apply economics. If for the work in hand a less expensive article will do, use it by all means. Among our products you will find a wide variety suitable for the different conditions at hand.

Manufactured by

**The Thermo Electric Instrument Co.**  
8 JOHNSON ST. NEWARK, N. J.

## The Microscope

By **SIMON H. GAGE** of Cornell University  
13th Edition, Published December, 1920

In this edition, special emphasis is put upon the Dark-Field Microscope. POSTPAID \$3.00.

**COMSTOCK PUBLISHING CO., Ithaca, N. Y.**

## Marine Biological Laboratory WOODS HOLE, MASS. Biological Material



1. **ZOOLOGY.** Preserved material of all types of animals for class work and for the museum.

2. **EMBRYOLOGY.** Stages of some invertebrates, fishes (including Acanthias, Amia and Lepidostus), Amphibia, reptiles and some mammals.

3. **BOTANY.** Preserved material of Algae, Fungi, Liverworts, Mosses, Ferns and Seed Plants.

4. **MICROSCOPE SLIDES** in Bacteriology, Botany and Zoology.

5. **LIFE HISTORIES, Germination Studies, and Natural History Groups.**

Catalogues furnished on application to

**GEORGE M. GRAY, Curator**  
WOODS HOLE, MASSACHUSETTS

# BIOLOGICAL STAINS

A Complete List for Bacteriology, Pathology, Botany, Zoology, Etc.

## CHEMICAL INDICATORS

Indicators for Every Purpose, including the Hydrogen-Ion Indicators

(Clark and Lub's List, Sorensen's List, Etc.)

## FINE ORGANIC CHEMICALS

Especially Prepared for Laboratory Use

By specifying Coleman & Bell products, you are assured of receiving chemicals manufactured under expert supervision and subjected, prior to sale, to the most rigid chemical and biological tests known. The result of our efforts to produce products of the highest quality is shown by the report of Dr. H. J. Conn, Chairman of the Committee on Technic, Society of American Bacteriologists. In the report of the committee upon "An Investigation of American Stains," (J. of Bact., Jan. 1922), it was stated that the Coleman & Bell stains were entirely satisfactory. In no instance did the product of any other concern surpass a C. & B. stain. In a number of instances, the marked inferiority of the pre-war German product to C. & B's stains was commented upon.

Write for our Catalogue of Biological Stains, Chemical Indicators and Organic Chemicals.

Coleman & Bell Products may be secured from Laboratory Supply Houses throughout the United States and in foreign countries, or may be ordered direct.

## THE COLEMAN & BELL COMPANY

NORWOOD, OHIO, U. S. A.

# AMERICAN-MADE WAVELENGTH SPECTROMETERS.

THE WAVELENGTH SPECTROMETER has become an essential adjunct to the well equipped Laboratory. Its convenience, accuracy and sturdy construction make the Wavelength Spectrometer an ideal instrument for spectrum and color analysis.

GAERTNER SPECTROMETERS embody the results of upward of twenty-five years of experience gained in the construction of precision optical instruments.

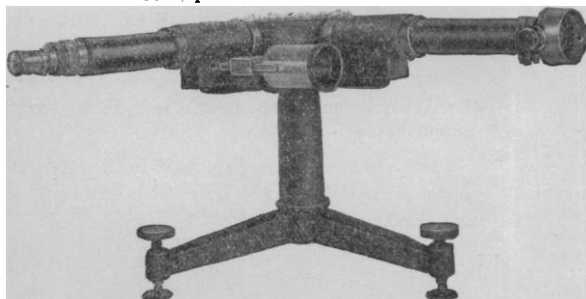
Prompt Delivery on Standard Instruments  
Our Specially Designed

## ULTRAVIOLET AND INFRARED SPECTROMETERS

are useful for many investigations. A very valuable combination in conjunction with the Wavelength Spectrometer is the improved

## NUTTING PHOTOMETER

Correspondence invited.



### Features:

- 1—DESIGN OF THE INSTRUMENT. The design of the instrument provides for greatest rigidity and permanence of adjustment as the composite parts have been reduced to a minimum by joining as many as practicable in a single casting, at the same time giving the Spectrometer a graceful appearance.
- 2—ACCURACY IN CALIBRATION. Greatest care is taken in calibrating the wavelength drum in order to insure the highest possible accuracy.
- 3—EASY READING OF DRUM. The divisions are sufficiently heavy and distinct and the figures ample and spaced to best advantage.
- 4—ESSENTIAL PARTS INCLUDED:  
Protection cap for prism—  
Leveling screws in tripod—  
Bilateral micrometer slit—  
Extra high power eyepiece—are furnished with the instrument and included in purchase price.

LABORATORY APPARATUS  
INSTRUMENTS OF PRECISION  
UNIVERSAL LABORATORY  
SUPPORTS

**Wm. Gaertner & Co.**

5345-49 Lake Park Avenue  
CHICAGO, U. S. A.